

## IN THE CLAIMS

*Please cancel claims 1, 4, 5-7, 10-15, and 18-23, and add new claims 26-38, as follows:*

1-25. (Canceled)

26. (New) A method of lexicographically sorting data for use by a data compressor to produce compressed data, the method comprising the acts of:

receiving a set of  $N$  cyclic shifts of  $N$  characters;

creating a sorting array of indexes  $\{0, 1, 2, \dots, N-1\}$  for identifying the set of  $N$  cyclic shifts of  $N$  characters, wherein each array element of the sorting array is the index of the array element in the array;

creating an inverse sorting array of indexes, such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

sorting the set of cyclic shifts based on a first character of each cyclic shift, where the array elements in the sorting array are updated in accordance with the sorting of the set of cyclic shifts and the array elements in the inverse sorting array are updated such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

iteratively sorting the set of cyclic shifts by, for an  $n$ th sorting iteration of the set of cyclic shifts, where  $n = 1, 2, 3, \dots$ , up to  $2^n > N$ :

identifying a subset of cyclic shifts which are equivalent for the first  $2^{(n-1)}$  characters;

updating indexes of the sorting array by:

for each array element of the sorting array associated with the identified subset of cyclic shifts, retrieving the array element of the inverse sorting array indexed by the array element of the sorting array plus  $2^{(n-1)}$  (modulo  $N$ );

sorting the retrieved array elements from the inverse sorting array;  
and  
        ordering the array elements of the sorting array corresponding to  
        the sorting of the retrieved array elements from the inverse sorting array;  
        updating the array elements of the inverse sorting array based on the  
updated array elements of the sorting array, such that each array element at index  
i of the inverse sorting array is the index of the array element in the sorting array  
containing the index i; and  
        repeating the iterative sorting steps for a next nth sorting iteration as necessary  
until the set of cyclic shifts are lexicographically sorted for the data compressor.

27. (New) The method of claim 26, wherein the act of sorting based on the  
first character comprises a radix sort.

28. (New) The method of claim 26, wherein the method is included in a  
Burrows-Wheeler Transform (BWT) clustering procedure.

29. (New) The method of claim 26, wherein the data compressor is embodied  
in a computer of a communication network.

30. (New) The method of claim 26, wherein the data compressor is embodied  
in a mobile communication device which is operative in a wireless communication  
network.

31. (New) A computer program product, comprising:  
memory;  
computer instructions stored in the memory; and  
the computer instructions being executable by a processor for lexicographically  
sorting data for use by a data compressor to generate compressed data by:

receiving a set of  $N$  cyclic shifts of  $N$  characters;

creating a sorting array of indexes  $\{0, 1, 2, \dots, N-1\}$  for identifying the set of  $N$  cyclic shifts of  $N$  characters, wherein each array element of the sorting array is the index of the array element in the array;

creating an inverse sorting array of indexes, such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

sorting the set of cyclic shifts based on a first character of each cyclic shift, where the array elements in the sorting array are updated in accordance with the sorting of the set of cyclic shifts and the array elements in the inverse sorting array are updated such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

iteratively sorting the set of cyclic shifts by, for an  $n$ th sorting iteration of the set of cyclic shifts, where  $n = 1, 2, 3, \dots$ , up to  $2^n > N$ ;

identifying a subset of cyclic shifts which are equivalent for the first  $2^{(n-1)}$  characters;

updating indexes of the sorting array by:

for each array element of the sorting array associated with the identified subset of cyclic shifts, retrieving the array element of the inverse sorting array indexed by the array element of the sorting array plus  $2^{(n-1)}$  (modulo  $N$ );

sorting the retrieved array elements from the inverse sorting array; and

ordering the array elements of the sorting array corresponding to the sorting of the retrieved array elements from the inverse sorting array;

updating the array elements of the inverse sorting array based on the updated array elements of the sorting array, such that each array

element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ; and

repeating the iterative sorting steps for a next  $n$ th sorting iteration as necessary until the set of cyclic shifts are lexicographically sorted for the data compressor.

32. (New) The computer program product of claim 31, wherein the act of sorting based on the comparison of the first character comprises a radix sort.

33. (New) The computer program product of claim 31, wherein the computer instructions are included in a Burrows-Wheeler Transform (BWT) clustering procedure.

34. (New) The computer program product of claim 31, wherein a computer embodies the processor having the data compressor.

35. (New) The computer program product of claim 31, wherein a mobile communication device embodies the processor having the data compressor.

36. (New) A system for communicating data, comprising:  
a wireless packet data network;  
a mobile communication device which operates in the wireless packet data network;  
a computer coupled to the wireless packet data network;  
the computer having a data compressor adapted to generate compressed data which is communicated to the mobile communication device;  
the computer having a lexicographical sorter adapted to lexicographically sort data for use in the data compressor by:  
receiving a set of  $N$  cyclic shifts of  $N$  characters;

creating a sorting array of indexes  $\{0, 1, 2, \dots, N-1\}$  for identifying the set of  $N$  cyclic shifts of  $N$  characters, wherein each array element of the sorting array is the index of the array element in the array;

creating an inverse sorting array of indexes, such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

sorting the set of cyclic shifts based on a first character of each cyclic shift, where the array elements in the sorting array are updated in accordance with the sorting of the set of cyclic shifts and the array elements in the inverse sorting array are updated such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ;

iteratively sorting the set of cyclic shifts by, for an  $n$ th sorting iteration of the set of cyclic shifts, where  $n = 1, 2, 3, \dots$ , up to  $2^n > N$ ;

identifying a subset of cyclic shifts which are equivalent for the first  $2^{(n-1)}$  characters;

updating indexes of the sorting array by:

for each array element of the sorting array associated with the identified subset of cyclic shifts, retrieving the array element of the inverse sorting array indexed by the array element of the sorting array plus  $2^{(n-1)}$  (modulo  $N$ );

sorting the retrieved array elements from the inverse sorting array; and

ordering the array elements of the sorting array corresponding to the sorting of the retrieved array elements from the inverse sorting array;

updating the array elements of the inverse sorting array based on the updated array elements of the sorting array, such that each array element at index  $i$  of the inverse sorting array is the index of the array element in the sorting array containing the index  $i$ ; and

repeating the iterative sorting steps for a next nth sorting iteration as necessary until the set of cyclic shifts are lexicographically sorted for the data compressor.

37. (New) The system of claim 36, wherein the act of sorting based on the first character comprises a radix sort.

38. (New) The system of claim 36, wherein the data compressor includes a Burrows-Wheeler Transform (BWT) clustering procedure.